

ABSTRACT

Semiconductor device fabrication methods are disclosed. According to one example, a method includes forming a pad oxide layer and a nitride layer sequentially on a silicon substrate, and forming a photoresist pattern for trench formation on the nitride layer; etching the nitride layer and the pad oxide layer using the photoresist pattern as a mask while etching the silicon substrate to form a trench using the nitride layer as an etch stopper; filling the trench by depositing an oxide layer for trench gap filling on entire surface of the silicon substrate; and performing planarization which makes the gap filling oxide exist only in the trench.